

REMARKS

Claims 13-24 and newly added claims 25-32 are currently pending in this application. Claims 13-15 and 20 are amended. Support for the claim amendments and the new claims can be found in the specification and drawings as originally filed. No new matter has been added.

35 U.S.C. §102 Rejections

Claims 13 and 15-18 stand rejected under 35 U.S.C. §102(b) for anticipation by WO 97/49477 (hereinafter "the '477 reference"). In view of the foregoing amendments and following remarks, Applicants respectfully request reconsideration of the rejection of claims 13 and 15-18 over the '477 reference.

Amended independent claim 13 is directed to a device for treating a gas/liquid mixture. The device includes a tube having an inlet opening for the mixture and an outlet opening (12) for the mixture located downstream. A rotating means (13) is arranged in the tube for setting the mixture into rotating movement. One or more outlet openings are arranged downstream relative to the rotating means for allowing a separate part of the mixture to flow laterally out of the tube. A return/recycle conduit (16) is arranged centrally in an axial direction through the rotating means (13) for reintroducing the flow which has exited via the outlet openings. The device includes divergence means in the return conduit for allowing the reintroduced flow to diverge substantially laterally outward from the return conduit. The flow path of the mixture includes moving up the tube, over the one or more outlet openings, and reintroducing the flow through the return conduit with the flow diverging substantially laterally outward from the return conduit.

The '477 reference discloses a device for treating a gas/liquid mixture. The device includes an inlet (A) for in-feed of the mixture, a flow element (4), an outlet (8), one or more feedback lines (B, D), an anti-creep flow interrupter (7). The flow element (4) is located in the inlet (A) and includes one or more swirling members (5) that cause turbulence in the mixture. The outlet (8) is located downstream of the flow element (4) for out-flow of the gas flow, which has had liquid at least partially removed therefrom. Additionally, one or more feedback lines (B, D) is connected onto a channel (6) arranged centrally in the flow element (4) for discharge as a separated liquid into a part of the gas flow.

The '477 reference does not teach or suggest a divergence means for allowing reintroduced flow to diverge substantially laterally outward from a return conduit as in amended independent claim 13. As shown, for example, in Fig. 2 of the present application, the reintroduced flow diverges substantially laterally outward from the return conduit (16), and then exits the opening (12). In the September 3, 2003 Office Action, the Examiner identifies the creep flow interrupter (7) of the '477 reference as the claimed "divergence means". The creep interrupter (7) is in the form of a truncated cone, as shown in Fig. 1 of the '477 reference. The Examiner states that the creep interrupter (7) will cause the reintroduced flow to diverge laterally outward. Applicants respectfully traverse the Examiner's conclusion.

The creep interrupter (7) disclosed by the Examiner as being the "divergence means" will not cause the reintroduced or recycled flow to diverge laterally as stated by the Examiner. In contrast, the recycle flow of the '477 reference will exit axially from channel (6) and not diverge outward at the creep interrupter (7). It is true that the conical form of the creep interrupter (7) may cause the main flow in cylindrical section (2) to diverge outward at the creep interrupter (7). However, the recycle flow will exit almost entirely axially out of channel (6). The conical creep interrupter (7) will have no divergent effect on the recycle flow. The recycle flow will remain in the circular shape of the channel (6) and will not diverge outwardly. The cone shaped creep interrupter (7) will cause the pressure and velocity of the recycle flow to decrease, but will not cause the flow to diverge outward, as this is a fundamental principle of fluid dynamics. Accordingly, the Examiner's statement regarding the '477 reference is incorrect, and this reference fails to teach or suggest the limitation in claim 13, which recites that the reintroduced flow diverges substantially laterally outward from the return conduit. Documentation of the foregoing principle can be provided to the Examiner upon request. For the foregoing reasons, Applicants respectfully request reconsideration of amended independent claim 13.

Claims 15-18 depend directly or indirectly from and add further limitations to independent claim 13, and are deemed to distinguish over the '477 reference for the reasons discussed hereinabove in connection with amended independent claim 13. Reconsideration of the rejections of claims 15-18 is respectfully requested.

35 U.S.C. §103 Rejections

Claim 19 stands rejected under 35 U.S.C. §103(a) for obviousness over the '477 reference. Claims 14, 20, and 21 stand rejected under 35 U.S.C. §103(a) for obviousness over the '477 reference in view of U.S. Patent No. 4,187,089 to Hodgson. Claims 22-24 stand rejected under 35 U.S.C. §103(a) for obviousness over the '477 reference in view of WO 93/05339 (hereinafter "the '339 reference").

Claim 19 depends from amended independent claim 13 and distinguishes over the '477 reference for the reasons discussed previously. Reconsideration of the Examiner's rejection of claim 19 is respectfully requested.

Claims 14, 20, and 21 stand rejected for obviousness over the '477 reference in view of Hodgson. Additionally, amended independent claim 20 distinguishes over the '477 reference for similar reasons as discussed hereinabove in connection with amended independent claim 13. Claims 14 and 21 depend from and add further limitations to independent claims 13 and 20, respectively, and distinguish over the '477 reference for the reasons discussed previously. Hodgson fails to overcome the shortcomings of the '477 reference. The Examiner cites Hodgson for teaching a baffle (44) having a conical face (43), which is connected to a beveled (i.e., divergent) recycle pipe (38) by divergent baffle ribs (46). The Examiner will note that the baffle structure disclosed by Hodgson exhibits the same diverging conical shape to that exhibited by the creep interrupter (7) disclosed by the '477 reference, and thus does not overcome the deficiencies of the '477 reference discussed previously.

Additionally, in contrast to the requirements of independent claims 13 and 20, the baffle (44) is adapted to reverse the flow of liquid contacting the baffle (44) so that the droplets fall to the bottom of chamber (14), see Fig. 1 of Hodgson and the discussion at column 3, lines 25-30 of Hodgson. Further, Hodgson does not teach or suggest a return conduit for reintroducing flow into tubing (18) as required by independent claims 13 and 20. For the foregoing reasons, Hodgson does not overcome the shortcomings of the '477 reference. In view of the foregoing, Applicants respectfully submit that amended independent claims 13 and 20, as well as claims 14 and 21, distinguish over the combination of the '477 reference and Hodgson. Furthermore, there would be no motivation to combine the teachings of Hodgson with that of the '477 reference.

Claims 22-24 stand rejected for obviousness over the '477 reference in view of WO 93/05339 (hereinafter "the '339 reference"). The '339 reference discloses a steam separator having a tube section (6) that houses a rotating means (5) adapted to rotate a mixture of steam and water in order to cause the water to form a film on the inside of the tube (6). The tube generally diverges, as shown in Fig. 3 of the '339 reference. Clearly, the '339 reference does not overcome the shortcomings of the '477 reference discussed previously. Additionally, the '339 reference discloses a similar diverging structure for tube section (6) to that disclosed by the '477 reference. Therefore, claims 22-24 distinguish over the cited prior art for the reasons discussed previously in connection with amended independent claims 13 and 20, as well as for the foregoing reasons.

Since the primary reference cited by the Examiner, the '477 patent, fails to teach or suggest the limitations added to independent claims 13 and 20, and neither Hodgson nor the '339 reference overcomes the deficiencies of the '477 reference, claims 13, 14, 19-21 and 22-24 are believed to be in condition for allowance. Reconsideration of the Examiner's rejections of claims 14, 19, 21, and 22-24 is respectfully requested.

This Amendment further includes new claims 27-32. New independent claim 27 is similar in form to independent claim 13, but recites that a divergence element is located in the return conduit and forms an obstruction in the reintroduced flow path causing the reintroduced flow to diverge substantially laterally outward from a return conduit. As discussed previously, the '477 reference does not teach or suggest causing a reintroduced flow to diverge substantially laterally outward from the return conduit. Independent claim 27 requires the divergence element to be located in the return conduit and form an obstruction for causing the reintroduced flow to diverge substantially laterally. The cited prior art fails to teach or suggest this limitation. Hodgson, as indicated previously, teaches away from this limitation (see column 3, lines 25-30 of Hodgson) and furthermore, there would be no motivation to combine Hodgson with the '477 reference.

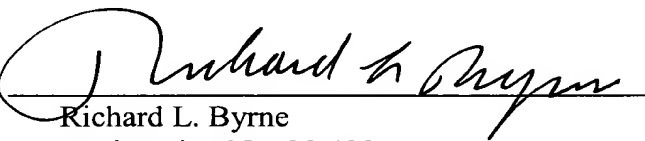
New claims 28-32 are similar to claims 14-18, but depend directly or indirectly from new independent claim 27. New claims 28-32 are believed to distinguish over the cited prior art for the reasons discussed hereinabove in connection with independent claims 13, 20, and 27.

Application No. 09/831,001
Paper Dated: October 3, 2003
In Reply to USPTO Correspondence of June 3, 2003
Attorney Docket No. 702-010717

In view of the foregoing, Applicants respectfully submit that pending claims 13-32 distinguish over the '477 reference taken alone or in combination with Hodgson and/or the '339 reference, and are in condition for allowance. Reconsideration of the Examiner's rejections and allowance of pending claims 13-32 are respectfully requested.

Respectfully submitted,

WEBB ZIESENHEIM LOGSDON
ORKIN & HANSON, P.C.

By 

Richard L. Byrne
Registration No. 28,498
Attorney for Applicants
700 Koppers Building
436 Seventh Avenue
Pittsburgh, Pennsylvania 15219-1818
Telephone: 412-471-8815
Facsimile: 412-471-4094